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10/538,507	06/09/2005	Fumio Kuriyama	2005_0929A	7103

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,507	KURIYAMA ET AL.	
	Examiner	Art Unit	
	ZULMARIAM MENDEZ	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 32-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Oberlitner et al. (US Patent no. 7,294,244).

With regard to claims 32 and 33, Oberlitner discloses an apparatus for processing a work piece (col.3, lines36-38), comprising: a plating tank (28, see figures 5 and 6) for holding a plating solution (col. 7, lines 41-44); and a stirring mechanism/paddle assembly (40, figure 4) having a stirring vane/paddle (132) immersed in the plating solution in the plating tank and disposed in a position facing a surface to be plated of a work piece (138; col. 12, lines 33-40), the stirring vane/paddle (132) being reciprocally movable parallel to the surface to be plated of the work piece (138) to stir the plating solution (col. 13, lines 52-61); wherein the stirring vane/paddle (132) has irregularities on at least one side thereof, the irregularities comprise a number of narrow grooves (150) defined at predetermined intervals and faces the surface to be plated of the work piece (figures 18-19; col. 12, lines 50-60).

3. Claims 35-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakaki (US Patent no. 6,875,333).

With regard to claim 35, Sakaki discloses a plating apparatus (col. 1, lines 7-8) comprising: a plating tank (10) for holding a plating solution (col. 7, lines 21-24); and a stirring mechanism (40, figure 1) having a plurality of stirring vanes (41, 80) immersed in the plating solution in the plating tank for stirring the plating solution (col. 10, lines 1-22); wherein the stirring vane (41) comprises a plurality of stirring vanes which are actuatable by respective independent drive mechanisms (col. 2, lines 37-40; col. 11, lines 52-54; col. 12, lines 41-53), wherein respective edges of the vanes (41 and 80) are aligned with each other to keep stirring surfaces of the vanes in alignment with each other as shown in figure 7.

With regard to claim 36, the stirring vanes of Sakaki may be different in shape (bar-like or L-shaped; col. 2, lines 55-65; col. 11, lines 52-54) .

With regard to claim 37, Sakaki discloses wherein the stirring vanes (41) are reciprocally movable in directions parallel to a surface to be plated of a work piece (abstract; col. 2, lines 55-65).

With regard to claims 38 and 39, Sakaki discloses a plating apparatus (col. 1, lines 7-8) comprising: a plating tank (10) for holding a plating solution (col. 7, lines 21-24); and a stirring mechanism (40, figure 1) having a stirring vane (41) immersed in the plating solution in the plating tank (col. 10, lines 1-22) wherein the stirring vane (41) comprises a plurality of stirring vanes (col. 2, lines 37-40; col. 11, lines 52-54); and

disposed in a position facing a surface to be plated of a work piece (abstract; col. 2, lines 55-65), the stirring vane (41) being reciprocally movable parallel to the surface to be plated of the workpiece to stir the plating solution (col. 2, lines 55-65); wherein the stirring vane (41) is operable to form an angle with respect to the surface the work piece which is variable as the stirring vane reciprocally moves and the direction in which the stirring vane moves is changed by angular movement of the rotational shaft (see figures 3a-3e; col. 8, lines 28-64; col. 12, lines 41-53).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 22-25, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (US Patent Application Publication no. 2002/0153246).

With regard to claim 22, Wang discloses an electrolytic apparatus (page 1, paragraph 3) comprising: a plating tank (100, see figure 7B) for holding a plating solution (34); a holder (29) for holding a workpiece (31) and bringing a surface to be plated of the workpiece (31) into contact with the plating solution (34) in the plating tank (100); and a nozzle pipe disposed in the plating tank (100) and having a plurality of plating solution injection nozzles (from the Liquid Mass Flow Controllers (LMFC) 21, 22, and 23 to inlets 8, 6, and 4, respectively) for injecting the plating solution (34) toward the surface to be plated of the work piece (31) held by the holder (29) to supply the plating solution (34) into the plating tank (100, see figure 7B). Even though Wang does not explicitly disclose wherein the nozzle is ring-shaped, it has been held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In re Rose* , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). Also see MPEP 2144.

With regard to claim 23, Wang discloses all of the structure, as applied to claim 22 above, but fails to explicitly disclose wherein streams of the plating solution (34) injected from the plating solution injection nozzles intersect each other on or in front of a substantially central area of the surface to be plated of the workpiece (31) held by the holder (29). However, Wang does disclose wherein the plating solution injection nozzles

are movable relative to the work piece (31) held by the holder (29; page 15, paragraphs 272 and 282; figures 32A-32D, and 54B). Therefore, one having ordinary skill in the art at the time of the invention would have found it obvious to move the stream of the plating solution in front of the central area of the surface of the workpiece to be plated in order to obtain a more uniform thickness distribution through the substrate's surface as it is well known in the art.

With regard to claim 24, Wang further discloses wherein the plating apparatus (100) comprises has at least one anode (1, 2, and 3; see figure 7B), and a plating voltage is applied between the anode (1, 2, and 3) and the workpiece (31) to perform electroplating on the work piece through the power supplies (13, 12, and 11, respectively; page 6, paragraph 123).

With regard to claim 25, the electrolytic apparatus of Wang comprises a plating solution injection nozzle (254; see figure 35A) for injecting the plating solution (34) toward the anode (1, 2, and 3) to supply the plating solution (34) into the plating tank (100).

With regard to claims 27 and 28, the workpiece (31) of Wang may be disposed horizontally as shown in figure 7B as well as vertically (page 16, paragraph 284).

With regard to claims 29 and 30, the nozzle pipe (from the Liquid Mass Flow Controllers (LMFC) 21, 22, and 23 to inlets 8, 6, and 4, respectively) of Wang is shaped to extend along an outer profile of the work piece (31; figures 7B, 13B) and is movable

relatively to the work piece (31) held by the holder (29; page 15, paragraph 282; figures 32A-32D).

With regard to claim 31, the housing of the plating solution injection nozzles of Wang may be made of an electrically insulating material (page 15, paragraph 282).

7. Claims 22, 26 and 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oberlitner.

With regard to claim 22, Oberlitner discloses an apparatus for processing a work piece (col.3, lines 36-38), comprising: a plating tank (28, see figures 5 and 6) for holding a plating solution (col. 7, lines 41-44); a holder/head assembly (42) for holding a workpiece (138) and bringing a surface to be plated of the workpiece (138) into contact with the plating solution (col. 9, lines 55-59) in the plating tank (28); and a ring-shaped nozzle pipe disposed in the plating tank (28) and having a plating solution injection nozzle (57, see figure 6) for injecting the plating solution toward the surface to be plated of the work piece (138) held by the holder (42) to supply the plating solution into the plating tank (28; col. 9, lines 22-31). Even though Oberlitner discloses having a single inlet nozzle instead of a plurality, it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one having ordinary skill in the art at the time of the invention to add more injection nozzles to the assembly of Oberlitner in order to enable the whole area of a target plating surface of a wafer to subjected to more uniform plating treatment and moreover, to enable a target

plating surface of a wider area to be subjected to a positive and uniform plating treatment as it is well known in the art.

With regard to claim 26, Oberlitner discloses wherein other processes which would be also suitable for use with the expanded capabilities of the paddle (132) include electroplating and electroless plating, among others (col. 19, lines 35-38)

With regard to claim 34, Oberlitner discloses all of the features as applied to claim 32 above, but fails to teach wherein the stirring mechanism/paddle assembly (40) has a plurality of the stirring vanes. It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one having ordinary skill in the art at the time of the invention to add more paddles to the assembly of Oberlitner in order to enable the whole area of a target plating surface of a wafer to subjected to more uniform plating treatment and moreover, to enable a target plating surface of a wider area to be subjected to a positive and uniform plating treatment as it is well known in the art.

Response to Arguments

8. Applicant's arguments filed on March 5, 2009 have been fully considered but they are not persuasive. The applicant argues the following:

a. Wang does not disclose a ring-shaped nozzle pipe disposed in the plating tank having a plurality of injection nozzles. However, the examiner does not find

this argument persuasive because it has been held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In re Rose* , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). Also see MPEP 2144. In addition, even the applicant suggests modifying the nozzles' shape depending on the outer profile of the workpiece.

b. Oberlitner does not disclose that the vane has irregularities on at least one side thereof for generating swirls in the plating solution when the stirring vane is reciprocally moved, the irregularities comprising a number of narrow grooves defined at predetermined intervals, among others. This argument has not been found persuasive because Oberlitner does disclose a paddle with irregularities/grooves (figures 18-19; col. 12, lines 50-60). It is noted that the limitation "for generating swirls in the plating solution when the stirring vane is reciprocally moved" is merely intended use of the system.

c. Sakaki discloses a first stirrer (41) and a second stirrer (80) wherein the second stirrer is gear-driven by external gear (51b) via ring-shaped gear (81). External gear (51b) also drives the first stirrer (41) via the driven gear. In response, the examiner does not find this argument persuasive because Sakaki

discloses wherein a first inner ring (61) rotates a pedestal (51) of the first stirrer (40) and a second inner ring (91) rotates a second stirrer (80) on the side below a diaphragm (70) and has two outer rings (62 and 92), to which driving shafts (12a and 12b) are connected, corresponding respectively to the inner rings (61and 91; col. 12, lines 41-53). Therefore, Sakaki does teach wherein the stirring vanes are actuatable by respective independent drive mechanisms.

d. Sakaki discloses a stirrer (41) which moves only in a direction parallel to the surface of the workpiece. In order to change an angle with respect to the surface of the workpiece there must be movement in a direction not parallel to the workpiece. The angles depicted in figures 3a-3e are with respect to the pedestal body 51a. In response, the examiner does not consider this argument persuasive because Sakaki discloses wherein the workpiece is first located in a position parallel to the vane/stirrer (41) as well as to the pedestal (51; figure 1). Therefore, it is inherent that if the stirring vane (41) is capable to form an angle with respect to the pedestal, it will also form an angle with respect to the surface to be plated of the work piece given that the pedestal and the workpiece are located parallel to each other (figures 1 and 7) and the stirring vane is rotated while the workpiece is maintained in a fixed position; wherein the angle is variable as the direction in which the stirring vane moves is changed (figures 3a-3e; col. 8, lines 28-64).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

10. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZULMARIAM MENDEZ whose telephone number is (571)272-9805. The examiner can normally be reached on Monday-Friday from 9am to 5pm.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa D. Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1795

/Z. M./
Examiner, Art Unit 1795